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Diptera: Tethinidae

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Abstract—The Tethinidae of Micronesia are revised based on study of over 2,000 specimens. The region contains 3 genera (*Tethina, Dasyrhicnoessa,* and *Pseudorhicnoessa*) and 8 species; 3 species are described as new: *Dasyrhicnoessa asymbasia,* n. sp., *D. boninensis,* n. sp., and *D. phyllodes,* n. sp. A key to the genera and species is provided.

Introduction

Of the species treated in this study, only one, *Dasyrhicnoessa insularis* (Aldrich), had previously been known and only from Wake I., but an examination of numerous specimens showed it to have a wide distribution throughout Micronesia. A taxonomic study of the Tethinidae in general became facilitated by the appearance of Hendel's (1934) "Revision der Tethiniden." Prior to this, Czerny (1928) had primarily contributed to our knowledge of the group in the Palearctic Region. The majority of the approximately 100 known species are distributed in the Palearctic (Soós 1978), Australasian/Oceanian (Mathis & Sasakawa 1989), Nearctic (Melander 1952), and Afrotropical (Cogan 1980) Regions.

In this paper, 3 genera and 8 species of the tethinid flies from Micronesia are dealt with. The dominance of the genus *Dasyrhicnoessa* Hendel is well illustrated in the material from Micronesia. The genus currently consists of 6 species, 3 of which are described as new.

For this study, I have examined some 2,000 specimens. Almost all of the specimens were obtained from the Bishop Museum, Honolulu (BPBM), the National Museum of Natural History, Washington, D.C. (USNM), and the Micronesian collections in Kyushu University, Fukuoka (KU). A few additional specimens were examined from the collections in Kyoto Prefectural University, Kyoto (KPU).

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Systematics

Key to the Micronesian Genera and Species of Tethinidae

1. Wing with costa extending to apex of vein M_{1+2}; scutellum bare on dorsal side; mid and hind tibiae without distinct bristles 2
   Costa extending only to R_{4+5}; scutellum setose on disc; mid and hind tibiae with antero- and posterodorsal bristles .... 8. *Pseudorhicnoessa spinipes*

2(1). Face with pair of shiny tubercles above vibrissal angles; eyes bare; epandrium with pair of knoblike projections on anteroventral corners, anterior and posterior surstyli fused .... 1. *Tethina orientalis*
   Face without such tubercles; eyes densely covered with minute hairs; epandrium with anterior and posterior surstyli separate (*Dasyrhicnoessa*) 3

3(2). Epandrium with anterior surstylus almost as long as or longer than posterior one 4
   Anterior surstylus much smaller than posterior one 7

4(3). Thorax testaceous to pale brown, gray-dusted; wing 1.0–1.8 mm long, with ultimate section of M_{3+4} more than 1/2 length of penultimate section 5
   Thorax blackish, densely gray-dusted; wing 1.6–2.2 mm long, with ultimate section of M_{3+4} almost 1/2 length of penultimate section 6

5(4). Wing 1.0–1.4 mm long, with ultimate section of M_{3+4} longer than penultimate section of M_{1+2}; anterior surstylus subquadrate, minutely setulose; posterior surstylus oblong, sparsely setose .... 7. *D. vockerothi*
   Wing 1.1–1.8 mm long, with ultimate section of M_{3+4} shorter than penultimate section of M_{1+2}; anterior surstylus oblong, sparsely setose; posterior surstylus somewhat rounded, bearing many sharp spines on inner ventral side .... 5. *D. ferruginea*

6(4). Epandrium with anterior surstylus densely setigerous on inner side, posterior surstylus sparsely setigerous, bearing 3 long and 3 short spines on tip; ejaculatory apodeme of normal shape, expanded distally .... 3. *D. boninensis*, **n. sp.**
   Epandrium with anterior surstylus with 2 rows of many spines along posterior margin, posterior surstylus densely setigerous on inner side; ejaculatory apodeme minute, papillate .... 4. *D. insularis*

7(3). Thorax testaceous, gray-dusted; wing 1.2–1.8 mm long; epandrium with only a pair of very long bristles on ventral sides; anterior surstylus clavate; posterior surstylus distinctly projected posteriorly, bearing about 10 spines on inner appex .... 2. *D. asymbasia*, **n. sp.**
   Thorax blackish, densely gray-dusted; wing 1.5–2.4 mm long; epandrium with about 3 pairs of very long bristles on ventral and dorsal sides; anterior surstylus swollen at base; posterior surstylus very broad in lateral view, bearing about 25 spines on inner apical margin .... 6. *D. phyllodes*, **n. sp.**

Table 1. Distribution of Micronesian Tethinidae

	Micronesian Island Groups									
	Bonin	S. Mariana	Palau	Yap	Chuuk	Pohnpei	Wake	Marshall	Kiribati	Other Localities
1. *Tethina orientalis*		x								Taiwan, Hong Kong, Ryukyus
2. *Dasyrhicnoessa asymbasia**		x	x	x		x	x	x		
3. *D. boninensis**	x									Volcano Is.
4. *D. ferruginea*		x	x	x						Seychelles, Marquesas, Philippines, Pitcairn I, Madagascar, Hong Kong
5. *D. insularis*		x	x	x	x	x	x	x	x	Hawaii, Christmas I, Canton I.
6. *D. phyllodes**		x	x	x		x				
7. *D. vockerothi*		x	x	x	x	x	x	x	x	Hawaii, Ryukyus
8. *Pseudorhicnoessa spinipes*	x	x	x	x		x		x		Taiwan, Philippines, N. Borneo, Vietnam, Ryukyus

* Described as new

Genus Tethina Haliday

Opomyza, subg. *Tethina* Haliday, 1838, Ann. Nat. Hist. 2: 188. Type species: *Opomyza illota* Haliday, 1838, by monotypy.

Rhicnoessa Loew, 1862, Wien. Entomol. Monatschr. 6: 174. Type species: *Rhicnoessa cinerea* Loew, 1862 [=*Anthomyza grisea* Fallén, 1823], by monotypy.

Phycomyza Melander, 1952, J. N.Y. Entomol. Soc. 21: 198. Type species: *Rhicnoessa milichioides* Melander, 1913, by original designation.

Head with 3 or 4 fronto-orbital bristles directed up and outward; frons with 3 or 4 pairs of inclinate interfrontal bristles on pollinose stripes; face with pair of shiny tubercles above vibrissal angles, median carina distinct or indistinct; eye bare; gena 1/5 to 1/2 height of eye, bare; true vibrissa absent, foremost peristomal seta distinctly longer than posterior ones. Antenna with 2nd segment without inner dorsal seta. Thorax densely gray-dusted; mesonotum with 1−2+3 dorsocentral bristles, 2–6 rows of acrostichal setae, prescutellar bristle strong; scutellum bare on dorsal surface. Wing hyaline; costa extending to apex of vein M_{1+2}, 2nd basal and discal cells distinct. Mid and hind tibiae without distinct bristles. Male

genitalia with anterior and posterior surstyli fused, or surstylus fused with epandrium on ventral side, phallus hairy on membrane.

Tethina is characterized by possessing a pair of shiny tubercles ventrolaterally on the face and by having bare eyes.

1. *Tethina orientalis* (Hendel)

Rhicnoessa orientalis Hendel, 1934, Tijdschr. Entomol. 77:47 (Taiwan).

Tethina orientalis (Hendel): Sasakawa, 1974, Akitu (N.S.) 1: 1 (Hong Kong); 1981, Kontyû 49: 520 (Ryukyus); 1986, Kontyû 54: 437 (Ryukyus).

Male. Head yellow to testaceous; ocellar triangle, occiput, and postgena black, whitish gray-dusted; frons ochreous to yellowish brown, distinctly darkened dorsally above level of anterior ocellus; parafrontalia, face, and gena whitish pollinose; postgena brownish ventrally. Antenna ochreous yellow to testaceous; arista dark brown. Thorax black, densely gray-dusted, pleura very slightly brown-tinged. Wing hyaline, veins ochreous yellow; calypter with fringe whitish; halter yellow. Legs yellow, coxae very slightly brownish at bases, femora entirely brown dorsally or only on dorsoapical 1/4–1/2, darker on hind femur, last 1 or 2 tarsal segments sometimes slightly brownish. Abdomen brown to brownish black, slightly gray-dusted, with 2nd to 5th tergites yellow on caudal 1/3; epandrium ochreous yellow to dark brown, cercus yellowish. All bristles and setae black.

Frons 1.5 × width of eye, narrowing ventrally; parafrontalia and parafacialia projecting above eye margin in profile, the former distinctly projected and bearing 3 or 4 fronto-orbital bristles; orbital hairs between fronto-orbitals inclinate, rather long; 3 pairs of inclinate interfrontal bristles, 2nd pair longest; eye slightly higher than wide (2:1.8); gena about 2/5 height of eye; face with median carina indistinct, rarely sharpened but narrow; peristomal setae 4 or 5. Antenna with 3rd segment almost as long as wide, minutely pilose; arista subequal to whole length of antennal segments, almost bare.

Mesonotum with 2+3 dorso-central bristles, 4 sparse rows of acrostichals, 3–6 pairs of median rows distinctly longer than lateral ones, prescutellar bristle strong. Wing: 2nd, 3rd, and 4th sections of costa in proportion of 5.5:1.6:08; R_{4+5} and M_{1+2} slightly convergent at apices; r-m before middle of discal cell; ultimate section of M_{1+2} about 2 × length of penultimate section; ultimate section of M_{3+4} less than 1/2 of penultimate (1.5:3.8) and shorter than penultimate section of M_{1+2} (1.5:2.1).

Genitalia: epandrium with anteroventral projections distinct; anterior surstylus fused with posterior one at base, somewhat incurved, spinulose and setulose ventrally; posterior surstylus lobate, bearing about 10 spines along caudal margin and many setae on inner dorsal and outer caudal sides; hypandrium U-shaped; phallic hood setose laterally; phallus with pair of narrow, weakly chitinized sclerites, hairy on membrane (Sasakawa 1974: figs. 1a–b, 5).

Lengths: body 2.4–3.0 mm; wing 2.1–2.8 mm (rarely less than 1.5 mm).

Female. Similar to male, but abdomen somewhat paler and anterior 2 tergites usually testaceous; ovipositor yellow.

Lengths: body 2.3–2.7 mm; wing 2.1–2.5 mm.

Distribution. Micronesia (S. Marianas), Taiwan, China (Hong Kong), Japan (Ryukyus). New to Micronesia.

MARIANA IS. GUAM: 1♂, Pt. Oca, v.1945, G.E. Bohart & J. L. Gressitt.

Remarks. This species was originally described based on a single female from Anping, Taiwan. It differs from 2 other Taiwanese species, *Tethina ochracea* (Hendel) and *T. sexseriata* (Hendel), by the number of rows of acrostichals. In the former species they are arranged in 2 rows, while in the latter they are arranged in 6 rows.

I have also examined specimens from Hong Kong and Okinawa (10♂, 4♀) collected in March and November, 1961–1962 by W. F. Pippin, C. Nibley, G. E. Bohart, and C. L. Harnage (USNM).

Genus *Dasyrhicnoessa* Hendel

Dasyrhicnoessa Hendel, 1934, Tijdschr. Entomol. 77:38. Type species: *Rhicnoessa fulva* Hendel, 1913, by original designation.

Head with 3–5 pairs of fronto-orbital bristles, 2–4 pairs of inclinate interfrontal bristles; face concave, without shiny tubercles above vibrissa angles; eye densely covered with minute hairs; 2nd antennal segment with distinct inner dorsal seta; true vibrissa present. Mesonotum with 1+3 dorso-central bristles, 4–6 rows of acrostichals, prescutellar strong; scutellum bare dorsally. Wing hyaline; costa extending to apex of vein M_{1+2} 2nd basal and discal cells distinct. Mid and hind tibiae without bristles. Male genitalia with anterior and posterior surstyli well developed, setigerous or spinose; phallus densely or sparsely hairy; ejaculatory apodeme usually expanded distally.

This genus is easily distinguishable from *Tethina* by the absence of a pair of shiny tubercles laterally on the face, the presence of dense hairs on the eyes, and the presence of vibrissae.

The distribution of *Dasyrhicnoessa* covers the Indian and Pacific oceans. It is represented by the Afrotropical/Oriental/Oceanian *D. ferruginea* (Lamb); the Oriental *D. fulva* (Hendel), *platypes* Sasakawa, *tripunctata* Sasakawa, *yoshiyasui* Sasakawa, and *vockerothi* Hardy & Delfinado (also Oceanian); the Oceanian *D. insularis* (Aldrich), *asymbasia* Sasakawa, n. sp., *boninensis* Sasakawa, n. sp., and *phyllodes* Sasakawa, n. sp.; the Australian *D. fulvescens* Malloch and *serratula* Malloch; and the Afrotropical *D. occidentalis* Munari. It is assumed that the Micronesian species of *Dasyrhicnoessa* are offshoots of those species from the Oriental Region with regard to the morphological relationships between the species.

Evolutionary development within *Dasyrhicnoessa* is seen in the change in structures of the male genitalia. A plesiomorphic character is the posterior surstylus, which is fused with the epandrium (*ferruginea, platypes, yoshiyasui,* and *asymbasia,* n. sp.). The most primitive species is the Oriental *D. platypes,* in which the posterior surstylus is provided with only long and slender hairs, the anterior surstylus is absent and the phallus is largely membranous and distinctly longer than the phallapodeme (Sasakawa 1986: fig. 3). However, in the other species the posterior surstylus is spinose on the inner tip, the anterior surstylus

is well developed, and the phallus is more or less sclerotized and slightly shorter than the phallapodeme (Sasakawa 1974: fig. 6; 1986: fig. 4).

In more recently evolved species, both surstyli are separated from the epandrium. These species are divided into 2 evolutionary lines, the *phyllodes* and *insularis* groups. The former group consists of 3 species, *phyllodes,* n. sp., *tripunctata,* n. sp., and *boninensis,* n.sp.), which posses spinose posterior surstyli seen in species of the primitive group. The latter group is represented by *insularis, vockerothi,* and *occidentalis.* In this latter group the posterior surstylus is only setose and the anterior surstylus is more developed than those of the *phyllodes* group.

2. ***Dasyrhicnoessa asymbasia*** Sasakawa, n. sp.

Male. Head testaceous to pale brown; parafrontalia, parafacialia, and gena yellowish; ocellar triangle with inner margins of ocelli linearly brown; parafrontalia, ocellar triangle, interfrontalia, and gena grayish pollinose; antenna testaceous, 3rd segment entirely darkened or darkened except either ventral margin or inner basal margin; arista brown; palpus yellow. Thorax testaceous to brown, gray-dusted; scutellum, humerus, pro- and pteropleura yellowish. Wing hyaline, veins testaceous; calypter with fringe testaceous; halter testaceous yellow. Legs testaceous; coxae, trochanters, and bases of femora yellowish; 5th tarsal segments of all legs somewhat darker than other segments. Abdomen pale brown, 2nd to 5th tergites with posterior margins yellow, tergites 1–2 rarely entirely yellow, sternites testaceous yellow; epandrium testaceous yellow; cercus yellow. All bristles and setae black.

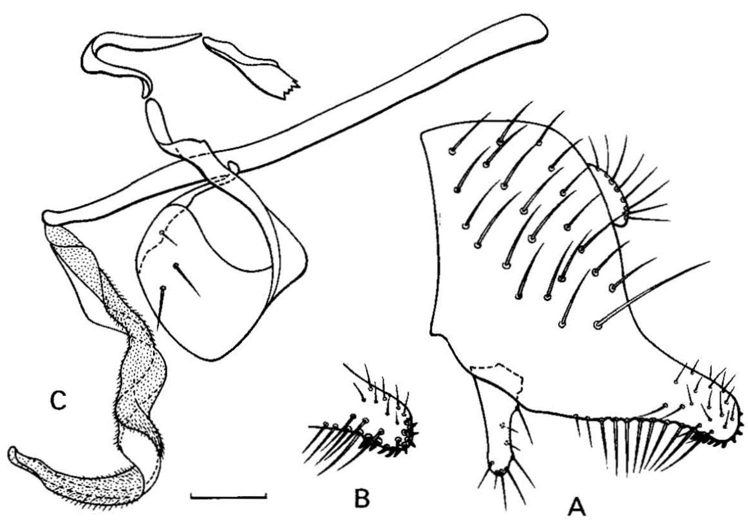


Figure 1. *Dasyrhicnoessa asymbasia,* n. sp., male genitalia.
A, epandrium and surstyli, lateral view; B, posterior surstylus, inner view; C, phallus and hypandrium, lateral view. Scale, 0.1 mm.

Head with frons nearly 2 × as wide as eye (in holotype), slightly narrowing ventrally; parafrontalia entirely projecting above eye margin in profile, bearing 3 fronto-orbital bristles; ocellar triangle with pair of slender setae (slightly shorter than ocellars) in addition to ocellar bristles; interfrontal bristles 3 (rarely 4), 1st slightly shorter than 2nd, 3rd shorter than 1st, accompanied by 2 setulae between 2nd and 3rd bristles and ventrad of 3rd; eye slightly higher than wide (1.3:1.1); gena about 1/6 height of eye. Antenna with 3rd segment almost as long as wide, minutely pilose; arista 1.2–1.5 × whole length of antenna, microscopically pubescent.

Mesonotum with 1+3 dorso-central bristle, 6 rows of acrostichals, prescutellar bristle long. Wing with 2nd, 3rd, and 4th sections of costa as 3.8:1.2:0.6; r–m almost at anterior 1/3 (0.9:1.6) length of discal cell; ultimate section of M_{1+2} nearly 2 (1.8–2.2) × as long as the penultimate section; ultimate section of M_{3+4} about 1/2 (0.4–0.6) length of penultimate section and slightly shorter than penultimate section of M_{1+2} (1.4:1.6).

Fourth abdominal tergite with usually 2 (2–4) extremely long posterodorsal bristles, 5th tergite with 3 (3–5) posterodorsal and lateral bristles.

Genitalia: epandrium with pair of very long bristles on ventrocaudal parts in addition to many lateral and dorsal setae, distinctly projected posteriorly forming posterior surstyli; anterior surstylus small, projected downward, sparsely setose; posterior surstylus with many strong setae along ventral margin, 10–20 spines on inner apex; cercus minute; praegonites each with 3 setae; phallus more or less twisted, slightly shorter than phallapodeme, minutely setulose; ejaculatory apodeme 480–560 μm long.

Lengths: body 1.86 (1.50–2.20) mm; wing 1.40 (1.20–1.60) mm.

Female. Similar to male, but 1st and 6th abdominal tergites (sometimes also 2nd) yellow laterally, cercus yellowish. Wing with costal sections in proportions of 4.5:1.3:0.7.

Lengths: body 2.11 (1.50–2.40) mm; wing 1.63 (1.40–1.80) mm.

Holotype male (USNM), Rummang I., Yap Is., Caroline Is., 17.vi.1957, at light, C.W. Sabrosky.

Paratypes. MARIANA IS. GUAM: 11♂, 23♀, 24.iii.1939 to 21.viii.1939, R. G. Oakley (USNM, Guam No. 1945, Boeing Clipper); 3♂, 1♀, 17.iv.1939, Oakley (Guam No. 2011, Honolulu Clipper); 1♀, 9.v.1939, Oakley (Guam No. 2111, California Clipper); 9♂, 21♀, 12.vi.1939, Oakley (Guam No. 2226); 1♂, 1♀, 17.vi.1939, Oakley (Guam No. 2236); 16♂, 10♀, 19.vi.1939, Oakley (Guam No. 2281); 3♀, 24.vi.1939, Oakley (Guam No. 2302); 5♂, 17♀, 4.vii.1939, Oakley (Guam No. 2341); 3♀, 23.vii.1939, Oakley (Guam No. 2414); 3♀, 24.vii.1939, Oakley (Guam No. 2423); 1♀, 31.vii.1939, Oakley (Guam No. 2461); 2♀, 21.viii.1938, Oakley (Guam No. 1177).

CAROLINE IS. POHNPEI: 1♂, Nana Mts. (Nanalaut, NW slope, ca. 500–1,500 ft.), 19.iii.1948, H. S. Dybas (FM). YAP: Yap I: 11♂, 11♀, topotypic, collected with holotype; 42♂, 23♀, topotypic, 19.vi,1957, at light, Sabrosky; 4♂, 4♀, Colonia, 8.vi.1957, swept on eel grass, low tide, Sabrosky; 5♂, 2♀, Yap, 13.vi.1957, 21.vi.1957, at light, Sabrosky; 2♂, 3♀, Yap, 21.vi.1957, at light, Sabrosky; 1♂, 2♀,

Weloy, 14.vi.1957, at light, Sabrosky; 2♀, Goror (Giliman), 12.vi.1957, swept on mangroves, Sabrosky; Gagil-Tomil I: 1♂, Gatjapar (Gachapal), 19.vi.1957, at light, Sabrosky (all USNM).

PALAU: Babelthuap I: 5♂, 13♀, Ngerechelong, 6.v.1957, swept on eel grass, Sabrosky; 6♀, Ogiwal (Ngiwal), 19.v.1957, at light, Sabrosky; 1♂, 5♀, Melekiok, 22–23.v.1957, on beach, Sabrosky (all USNM); 4♂, 4♀, Ulimang, 10–13, 16.xii.1947, Dybas (FM). Koror I: 10♂, 13♀, 14–16.iv.1953 to 14.xii.1952, J. W. Beardsley, Sabrosky, J. L. Gressitt (USNM, BPBM, MRW). Peleliu I: 8♂, 22♀, N end, 28.v.1957, at light, Sabrosky (USNM); 8♂, 11♀, Mt. Amiangal, 22.xii.1952, at light, Gressitt (BPBM). Ngesebus I: 2♂, 29.v.1957, Sabrosky (USNM). Ngurukdapel I: 1♂, Ngaremediu, 24.iv.1957, on beach, Sabrosky (USNM). Ulebeshel I: 1♂, 24.iv.1957, on beach, Sabrosky (USNM).

WAKE I.: 1♂, 3♀, 1.iii.1959, Y. Oshiro; 2♂, 4♀, 21.xi.1959, at light, E. J. Ford (USNM); 1♀, Peale I., 17.xi.1953, C. R. Joyce; 1♂, 1♀, Peale I., 15.ii.1959, Oshiro; 1♂, Peale I., 1.viii.1940, at greenhouse light, T. Lyons.

MARSHALL IS. 1♂, 1♀, Namorik I., Namorik Atoll, 23.ix.1953, J. W. Beardsley.

Distribution: Micronesia [Mariana Is. (including Guam), Caroline Is., Palau, Marshall Is., Wake I.].

Discussion. This new species differs distinctly from *D. phyllodes,* n. sp., in the coloration of the thorax and structures of the male genitalia. The male genitalia of this species somewhat have a resemblance to those of *D. ferruginea* (Lamb) and *D. yoshiyasui* Sasakawa, known from the Ryukyus, in the structure of surstyli, but the number of long bristles on epandrium, size of anterior surstylus and direction of posterior surstylus are quite different among them.

Remarks. This species exhibits a variation in the coloration of the abdomen, that is, the 1st and 2nd tergites are sometimes entirely yellow.

3. ***Dasyrhicnoessa boninensis*** Sasakawa, n. sp.

Male and female. Head testaceous yellow to pale brown; frons more or less darkened dorsally; ocellar triangle, occiput, and dorsal parts of postgena brownish black; parafrontalia, face, and gena paler; frons, gena, and postorbit pollinose; antenna with 1st and 2nd segments testaceous yellow, 3rd segment almost entirely brown except inner ventral margin, sometimes only brown on dorsal ½ of inner side, rarely concolorous with basal 2 segments; arista brown; palpus yellow. Thorax black, mesonotum densely dusted with gray, scutellum testaceous to pale brown, becoming darker anteromesally and paler posteriorly; humerus and notopleuron brownish, meso- and sternopleura brownish black. Wing hyaline, very faintly tinged with gray, veins testaceous, costa darker; halter testaceous. Legs testaceous, tarsal segments 4–5 somewhat darkened. Abdomen brownish black, subshining, sparsely pollinose, 1st and 2nd tergites paler, brownish yellow laterally, 2nd to 4th tergites with caudal margins yellow to pale brown, sternites testaceous; epandrium brown, cercus testaceous; ovipositor yellowish. All bristles and setae black.

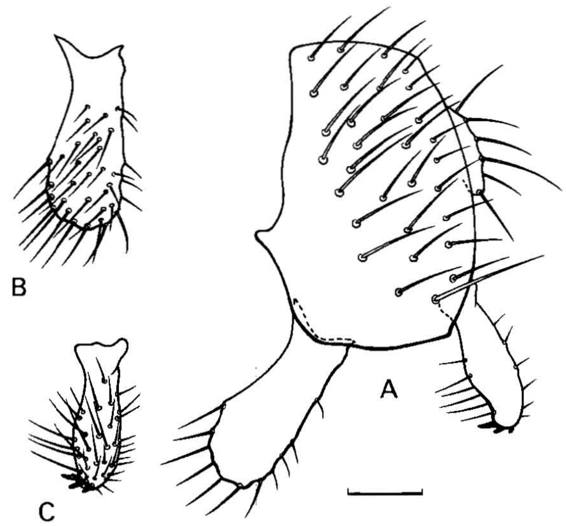


Figure 2. *Dasyrhicnoessa boninensis*, n. sp., male genitalia.
A, epandrium and surstyli, lateral view; B, anterior surstylus, inner view; C, posterior surstylus, inner view. Scale, 0.1 mm.

Differs from *D. insularis* as follows except for characteristics of the male genitalia given in the key:

Frons about 1.75 × as wide as eye; interfrontals 4 pairs, 2nd and 3rd pairs subequal in length and longer than the 1st and 4th; posterior ocellar about 1/2 length of anterior ocellars; eye slightly higher than wide; gena 1/7 to 1/5 height of eye; arista almost as long as whole length of antenna. Wing with ultimate section of M_{1+2} about 1.75 (1.5–2.0) × as long as the penultimate; ultimate section of M_{3+4} about 1/2 (0.5–0.6) length of penultimate and shorter than penultimate section of M_{1+2} (1.8:2.3).

Male genitalia: epandrium with anterior and posterior surstyli lobate, the former setigerous on inner side and the latter somewhat narrowing distally and bearing usually 3 strong and 3 small spines on tip; phallus shorter than phallapodeme (6:7.5); ejaculatory apodeme about 450 μm long and 230 μm in broadest width.

Lengths: body 2.22 (1.8–3.0) mm, wing 1.87 (1.6–2.1) mm.

Holotype male (BPBM 12,773), Omura "Camp beach," Chichi Jima, Bonin Is., 2–25.iv.1958, F. M. Snyder.

Paratypes: BONIN IS: Chichi Jima: 1♂, Omura, 18.ix.1934, M. Okabe & D. H. Ikeda; 20♂, 11♀, same data as holotype; 5♂, 3♀, Okumura "Yankee Town," 8–15.iv.1958, Snyder; 1♂, 1♀, Miyanohama "Jack William's beach," 15–21.iv.1958, Snyder. Ani Jima: 6♂, 1♀, Sen-zan (NE Bay), 28.v.1958, Snyder. Haha Jima: 1♂, 2♀, Okimura, 26.iv–9.vi.1958, Snyder. VOLCANO IS: Minami Iwo Jima: 1♀, 20.vi.1982, M. Sato (KPU).

Distribution: Bonin Is., Volcano Is.

4. *Dasyrhicnoessa ferruginea* (Lamb)

Rhicnoessa ferruginea Lamb, 1914, Trans. Linn. Soc. Lond., Zool. 16:367 (Seychelles).

Tethina lasiophthalma Malloch, 1933, Bull. B. P. Bishop Mus. 114:17. (Marquesas I.)

Dasyrhicnoessa lasiophthalma: Sasakawa, 1974, Akitu (N.S.) 1:2. (Philippines, Hong Kong); Steyskal and Sasakawa, 1977, Catal. Dipt. Orient. Reg. 3:394.

Dasyrhicnoessa ferruginea: Munari, 1988, Soc. Venet. Sci. Nat. Lavori 13:48; 1991, Ann. Natal Mus. 32:180.

Male and female. Head testaceous, parafrontalia yellowish white pruinose, ocellar triangle brown (rarely paler), face and gena testaceous yellow, the latter whitish pruinose; antenna yellow to testaceous yellow, 3rd segment more of less brownish on dorsal 1/2, arista brown; palpus yellow. Thorax testaceous to pale brown, dusted with gray, posterior margin of scutellum and ventral pleura more or less paler than mesonotum. Wing hyaline, veins yellow to testaceous, costa slightly darker; calypter with margin and fringe yellow; halter yellow. Legs yellow, 5th segment of all tarsi slightly brown tinged. Abdomen subshining testaceous to dark brown, sparsely gray-dusted; anterior 2 and 6th tergites sometimes paler, 2nd to 5th tergites usually with broad yellow caudal margins; epandrium testaceous.

Frons 1.8 (1.7–2.1) × as wide as eye, converging ventrally; fronto-orbital and interfrontal bristles each 3, the latter rarely 2 or 4; ocellar bristle subequal to 1st fronto-orbital in length; eye about 1.2 × as high as broad; gena 1/5 to 1/6 height of eye; vibrissa as long as anterior 2 peristomal setae which are usually 5

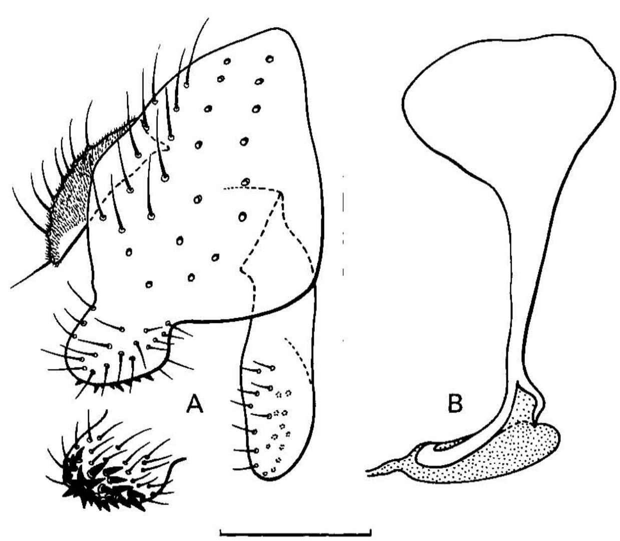


Figure 3. *Dasyrhicnoessa ferruginea* (Lamb), male genitalia.
A, epandrium and surstyli, lateral view and inner side of posterior surstylus; B, ejaculatory apodeme. Scale, 0.1 mm.

in number. Antenne approximated at bases; 3rd segment as long as broad, distinctly pilose; arista 1.2 × as long as 3rd segment, microscopically pubescent.

Mesonotum with 1+3 dorso-central bristles, 6 rows of acrostichals, becoming sparser (4 rows) behind level of 3rd dorso-centrals; prescutellar bristle strong. Wing: costa with 2nd, 3rd and 4th sections in proportion of 5.4:1.8:0.9, r–m distinctly before middle of discal cell (1.0:1.9), ultimate section of M_{1+2} 1.8 (1.7–2.5) × as long as the penultimate, ultimate section of M_{3+4} mostly 3/5 (0.5–0.8) length of penultimate section.

Male genitalia: epandrium with anterior surstylus longer than posterior, projected ventrally or anteroventrally, sparsely setigerous; posterior surstylus projected roundly, somewhat incurved, bearing many setae on outer side and 20–30 spines on inner ventral part; phallic hood striate; phallus slightly shorter than phallapodeme; ejaculatory apodeme expanded distally.

Lengths: body, male 1.71 (1.4–2.2) and female 1.78 (1.5–2.2) mm; wing, male 1.43 (1.1–1.5) and female 1.65 (1.3–1.8) mm.

Distribution: Marquesas Is., Micronesia (new to Mariana Is., Caroline Is., and Palau), Philippines, China (Hong Kong), Seychelles, Madagascar.

MARIANA IS. SAIPAN: 1♂, Sadog, Talofofo, 12.ii.1945, H. S. Dybas; 76♂, 163♀, Lau Lau Beach, swept over rocks and seaweeds, 8.viii.1977, J. A. Tenorio. GUAM: 1♂, 17.vi.1939, R. G. Oakley (Guam No. 2250).

CAROLINE IS. YAP: 1♀, Rumang I., 17.vi.1957, at light, C. W. Sabrosky; 1♀, Goror, Yap I., 12.vi.1957, Mangroves, Sabrosky.

PALAU: Babelthuap I: 2♂, 10♀, Ogiwal (Ngiwal), 19.v.1957, at light, Sabrosky; 1♂, 4♀, SW of Koror I., 25 m, 4.xii.1952, at light, J. L. Gressitt. Koror I.: 2♂, 20♀, 16–17.iv.1957, Sabrosky; 2♂, Ngerabad, 17.iv.1957, at light, Sabrosky. Peleliu I: 2♂, 8♀, Mt. Amiangal, 22–23.xii.1952, at light, Gressitt; 5♂, 1♀, N. end, 28.v.1957, at light, Sabrosky. Ngesebus I: 7♂, 6♀, 29.v.1957, Sabrosky.

5. *Dasyrhicnoessa insularis* (Aldrich)
Tethina insularis Aldrich, 1931, Proc. Hawaii. Entomol. Soc. 7:395 (Wake I.)
Rhicnoessa insularis: Hendel, 1934, Tijdschr. Entomol. 77:48.
Dasyrhicnoessa insularis: Hardy and Delfinado, 1980, Insects Hawaii 13:371.

Male. Head with frons testaceous to pale brown, parafrontalia yellow to testaceous, gray-dusted; ocellar triangle ochreous brown to black, gray-dusted; face and gena pale yellow to testaceous, gena silvery pruinose; occiput and dorsal 1/2 of postgena ochreous to dark brown, gray-dusted; antenna yellow to testaceous, 3rd segment infuscated entirely or dorsoapically except ventral margin, arista brown; palpus yellow to testaceous. Thorax dark brown to black (rarely paler), densely gray-dusted, humerus largely yellow; scutellum dark brown, becoming paler toward apex; pleura except meso- and sternopleuron brownish. Wing hyaline, slightly tinged with brownish gray on anterior 1/2; veins yellowish brown to brown; calypter with margin orange and fringe pale brown; halter ochreous to testaceous, knob sometimes brownish. Legs yellow to testaceous, coxae of mid and hind legs basally, distal 1/2 of all femora, and basal parts of all tibiae sometimes tinged with brown, 4th and 5th tarsal segments or only 5th of all legs pale brown.

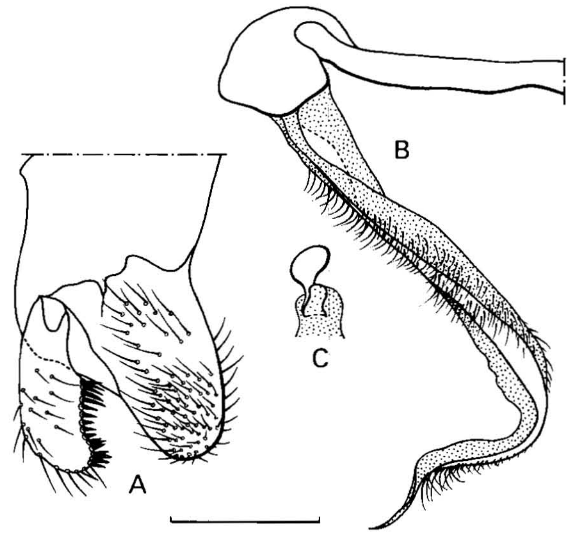


Figure 4. *Dasyrhicnoessa insularis* (Aldrich), male genitalia.
A, anterior and posterior surstyli, inner view; B, phallus, lateral view; C, ejaculatory apodeme. Scale, 0.1 mm.

Abdomen brownish black to black, subshining, faintly with gray pollinosity, 2nd to 5th tergites usually with yellow caudal margins; epandrium shiny brown, cercus yellowish. All bristles and setae black.

Frons 1.5 × as wide as eye, narrowing ventrally; fronto-orbital bristles 3, 1st directed up- and outwards, 2nd and 3rd outwards; orbital setulae of outer row directed upwards but those of inner row inwards; 3 pairs of interfrontal bristles inclinate, 2nd longer than others; ocellar triangle with a pair of setae just behind ocellar bristles; face concave; eye about 1.20–1.33 × as high as wide; gena $^1/_7$ to $^1/_8$ height of eye; peristomal setae 4 to 6, anterior 2 strong. Antenna with 3rd segment a little longer than broad, minutely pilose; arista nearly 1.33 × as long as whole length of antenna, minutely pubescent.

Mesonotum with 1+3 dorso-central bristles, 6 rows of acrostichals, prescutellar bristle strong; sternopleuron with rather long seta before base of sternopleural bristle. Wing: costal sections in proportion of 4.8:1.5:0.8, r–m at anterior $^1/_3$ of discal cell, ultimate section of M_{1+2} about 2 (1.8–2.2) × as long as the penultimate, ultimate section of M_{3+4} about $^1/_2$ (0.5–0.7) of the penultimate and slightly shorter than penultimate section of M_{1+2} (1.9:2.1).

Genitalia: epandrium with anterior surstylus somewhat curved posteriorly, narrowing apically, bearing 23–25 strong spine-like setae in 2 rows; posterior surstylus projected, bearing slender setae on outer side and strong setae on inner side; phallapodeme membranous on basal $^1/_3$; phallus subequal to phallapodeme in length, mostly membranous, with long and narrow chitinized sclerite throughout almost its whole length; ejaculatory apodeme minute, papillate.

Lengths: body 2.1–2.8 mm, wing 1.7–2.1 mm.

Female. Similar to male, but 6th abdominal tergite entirely yellowish brown; ovipositor yellow; 2nd section of costa slightly longer than that of male.

Lengths: body 2.4–3.0 mm, wing 1.7–2.2 mm.

Distribution: Micronesia (new to Mariana Is., Caroline Is., Marshall Is., Kiribati, Christmas I.), Hawaii, and Wake I.

MARIANA IS. SAIPAN: 1♀, Chalan Canoa, 11.v.1940, K. Yasumatsu & Yoshimura (KU). TINIAN: 1♂, 1♀, Tinian Harbor, 20.iii.1945, H. S. Dybas.

CAROLINE IS. POHNPEI: 2♂, 7♀, Matanluk (Yepan Pt., 16 m), Lele, 24.i.1953, at light, J. L. Gressitt; 2♂, 1♀, Matanluk, 22m, 26–30.i.1953, J. F. G. Clarke; 4♂, 13♀, Matanluk, 3–19.ii.1953, Clarke; 4♂, 8♀, Pukusrik, 1 m, Lele, 13.ii.1953, Clarke; 1♀, Mt. Tafojat, 518 m, 9.ii.1953, Clarke; 1♀, Malam River, 30 m, Mechlwem, 17.iii.1953, Clarke; 9♂, 9♀, Pukusrik, 1 m, Lele, 2–3.iv.1953, Clarke; 1♀, Mwot, Techfuwnsaek, 10.iv.1953, Clarke; 1♀, Sensrik, 1 m, 21.iv.1953, Clarke; 1♀, Lelo, 21.xi.1937, T. Esaki (KU); 2♀, Nampir-Colonia, 5.i.1938, Esaki (KU); 26♂, 27♀, Agr. Exp. Stat., Colonia, 6–11.i.1953, Gressitt; 1♂, 1♀, Colonia, 14.i.1953, Clarke; 9♂, 3♀, Colonia, 17–31.i.1949, M. Ross (USNM. Hawaii-4718, M2120; Hawaii-4719, M2125, 49-6340–41); 3♂, 3♀, Colonia, near sea level, 26.ii.1948, Dybas (USNM); 1♂, 4♀, Colonia, v.1949, Ross (USNM, Hawaii-4719, M2121, 49-6304); 2♀, Colonia, viii.1956, M. R. Wheeler (MRW); 3♂, 3♀, Colonia, 31.xii.1937, Esaki (KU). CHUUK: 7♂, 16♀, Civ. Ad. Area, Moen I., 1–26.iii.1949, R. W. L. Potte. YAP: 4♂, Rumang I., 17–21.vi.1957, at light, C. W. Sabrosky; 1♂, 2♀, Rumang I., vii–viii.1950, R. J. Goss; 5♀, Rumang I., 9.viii.1950, Goss; 2♂, 5♀, Map I., vii.–10.viii.1950, Goss; 1♂, 1♀, Yap I., 28.iii.1954, J. W. Beardsley; 2♀, Goror (Giliman), Yap I., 11.vi.1957, Sabrosky; 1♂, Yap (Colonia), Yap I., 21.vi.1957, Sabrosky; 16♂, 12♀, Yap (Colonia), Yap I., vii–viii.1950, Goss; 4♀, N. of Yap I., vii–viii.1950, Goss; 1♀, Kanif, Yap I., vii–viii.1950, Goss; 1♂, 2♀, Dugar, Yap I., 14.viii.1950, Goss; 1♂, Gatjapar, Gagil-Tomil I., 19.vi.1957, at light, Sabrosky.

PALAU: 1♀, Ngaremlengui, Babelthuap I., 4.vi.1957, Sabrosky; 5♀, Ulimang, Babelthuap I., 13,19,26.xii.1947, H. S. Dybas (USNM, MRW); 2♀, Koror I., 16.iv.1952, at light, Beardsley; 1♀, Koror I. (NE), 28.iv.1957, at light, Sabrosky; 1♀, Koror I., 5.v.1953, Beardsley; 1♀, Koror-Arabaketsu, 30.v.1938, S. Murakami (KU); 1♀, Koror I. (SW), 25 m, 14.xii.1952, at light, Gressitt; 2♂, Pelelieu I. (North end), 28.v.1957, at light, Sabrosky; 1♀, Ngesebus I., 29.v.1957, Sabrosky.

WAKE I.: 1♀ (paratype, USNM 41629), Pearl & Hermes, 27.iv.1923, D. T. Fullaway; 7♀ (paratypes, BPBM), 30.vii–1.viii.1923, E. H. Bryan, Jr.

MARSHALL IS: MAJURO: 4♂, 10♀, Uliga, Majuro Atoll, vii–ix.1955, M. R. Wheeler (USNM); 1♂, 2♀, Majuro Atoll, 3.xi.1953, Beardsley; 1♂, Majuro Atoll, 8.xi.1953, Beardsley. JAPTAN: 4♂, 5♀, Ralik Chain (Eniwetok Atoll), viii–ix.1955, Wheeler (USNM); 4♂, 6♀, Ralik Chain, 29.viii–1.ix.1956, L. D. Tuthill. PARRY: 2♂, 3♀, Ralik Chain, viii–ix.1955, Wheeler (USNM). LIB: 10♀, 23.x.1953, Beardsley; 1♂, Ennubirr, Kwajalein Atoll, 28.x.1964, B. D. Perkins. JIBU: 1♂, Jin, Ailinglaplap Atoll, 29.iv.1958, Gressitt. JALUIT: 2♂, 2♀, Jobor, 25–30.iv.1958, Gressitt; 1♂, Elizabeth, 11.xi.1964, Perkins. NAMORIK: 2♀, Namorik Atoll, 23.xi.1953 Beardsley.

KIRIBATI: BUTARITARI I.: 6♂, 11♀, Butaritari Atoll, xii.1957, N. Krauss. MAKIN: 3♂, 8♀, Butaritari Atoll, 13.xi.1964, Perkins. EITA: 1♂, Tarawa Atoll, xii.1957, Krauss. TARAWA: 4♂, 10♀, Bikenibeu, i.1970, Krauss. ABEMAMA: 3♂, 2♀, Kariatebike, i.1970, Krauss.

LINE IS: CHRISTMAS I: 1♂, 2♀, Canyon, 5ft., 21.xi.1934, E. C. Zimmerman.

Remarks. The sex of all paratypes used in the original description from Wake I. is not the male. The combination of black bristles and setae on the body and 6 rows of the acrostichal setae distinguishes this species from the Oriental *D. fulva* (Hendel).

6. ***Dasyrhicnoessa phyllodes*** Sasakawa, n. sp.

Male. Head with frons dark testaceous to brown, becoming paler ventrally; parafrontalia testaceous, gray-dusted, ventrally yellowish; ocellar triangle, occiput and dorsal postgena dark brown to brownish black, gray-dusted; gena yellow, silvery pruinose; face yellow to testaceous; antenna testaceous, 3rd segment brown except testaceous ventral margin, arista brown; palpus yellow. Thorax dark brown to brownish black, densely gray-dusted; scutellum with tip more or less paler than mesonotum; humerus, notum laterally, propleuron, and posterior pleura paler. Wing hyaline, faintly tinged with brownish gray anteriorly, veins testaceous;

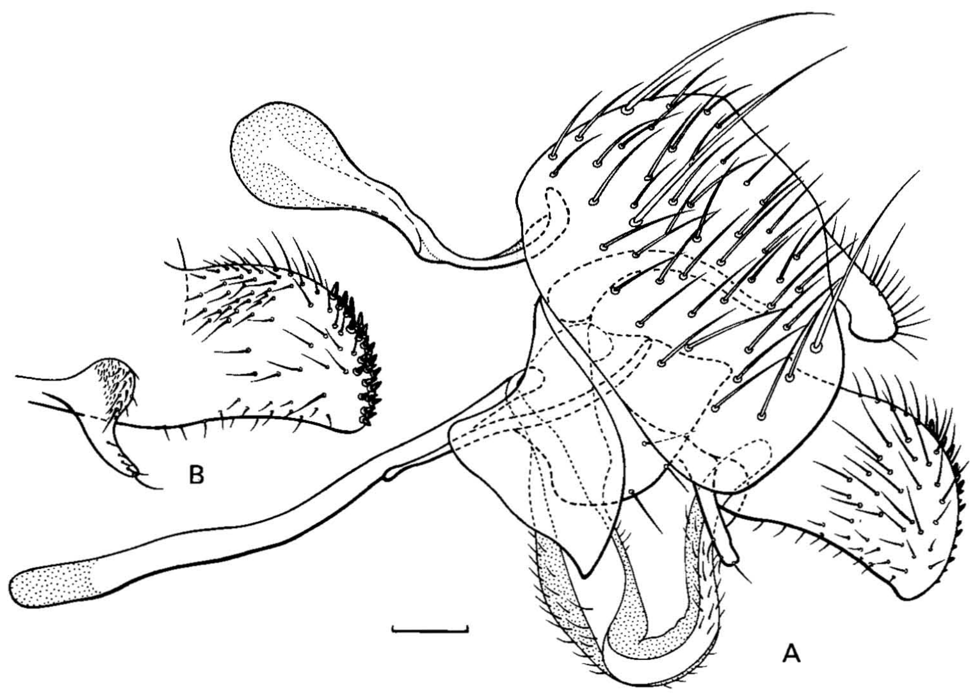


Figure 5. *Dasyrhicnoessa phyllodes*, n. sp., male genitalia.
A, epandrium, hypandrium, phallus and ejaculatory apodeme, lateral view; B, anterior and posterior surstyli, inner view. Scale, 0.1 mm.

calypter with fringe brown; halter testaceous. Legs yellow to testaceous, fore coxa yellowish, 4th and 5th tarsal segments brownish. Abdomen brown to brownish black, subshining, slightly gray-dusted; 1st tergite usually testaceous, 2nd to 5th tergites with posterior margins narrowly yellow, 3rd to 5th tergites with dark lateral spots not pollinose; sternites pale testaceous; epandrium shining brown, cercus yellowish.

The general structures and wing venation are very similar to those of *D. insularis* except for the following points: 3rd antennal segment as long as broad, arista 1.5 × as long as whole length of antenna; ultimate section of M_{3+4} subequal to penultimate section of M_{1+2} (1.8:1.9 in males, 2.0:2.0 in females).

Genitalia: epandrium with about 3 pairs of very long bristles in addition to many setae; anterior surstylus small, claw-like, swollen at base, not pointed apically; posterior surstylus very broad in lateral view, bearing 24–26 heavy spines along inner apical margin, setigerous on inner and outer sides; praegonites with 3 pairs of setae; phallus sparsely hairy on membrane; ejaculatory apodeme weakly expanded distally.

Lengths: body 2.09 (1.8–2.3) mm, wing 1.78 (1.5–2.0) mm.

Female. Similar to male; 6th and 7th abdominal tergites with posterior margins very narrowly yellow; ovipositor pale brown, cercus yellow to testaceous.

Lengths: body 2.21 (1.7–2.9) mm, wing 1.99 (1.6–2.4) mm.

Holotype male (USNM), Almongui (Ngaramlungui), Babelthuap I., Palau Is., 3.vi.1957, at light, C. W. Sabrosky.

Paratypes: MARIANA IS. GUAM: 1♀, Pt. Oca (NMRU 2), at light, 29.vi.1945, G. E. Bohart & J. L. Gressitt; 1♂, 2♀, Nimitz Hill, 4.v.1956, at light, C. F. Clagg (USNM).

CAROLINE IS. KOSRAE: 1♀, Lele I., 23.vii.1949, R. P. Owen; 1♀, Matanluk (Yepan), 24.i.1953, at light, Gressitt. POHNPEI: 1♀, S. of Nanponmai, 18.i.1953, J. F. C. Clarke. YAP: 9♂, 8♀, Rumang I., 17 & 19.vi.1957, at light, Sabrosky; 1♀, Yap (Colonia), Yap I., 26.ii.1948, H. S. Dybas (USNM); 2♀, Yap (Colonia), Yap I., 8.vi.1957, Sabrosky; 2♀, Giliman, Yap I., 11.vi.1957, Sabrosky; 1♀, Rull, Yap I., 11.vi.1957, Sabrosky; 1♀, Weloy, Yap I., 14.vi.1957, at light, Sabrosky; 2♂, Weloy, 20.vi.1957, at light, Sabrosky; 1♀, Gachapan, Gagil, Yap I., 19.vi.1957, at light, Sabrosky; 2♂, 9♀, Yap (Colonia), 21.vi.1957, at light, Sabrosky.

PALAU: Babelthuap I: 1♂, 12.xii.1947, Dybas (USNM); 4♂, 14♀, Ulimang, 9–13, 19 & 26.xii.1947, Dybas; 2♀, Ngerechelong, 8.v.1957, Sabrosky; 2♀, Melekeiok, 23.v.1957, on beach, Sabrosky; 6♂, 5♀, Ngaramulungui, 3–4.vi.1957, at light, Sabrosky; 1♀, Aimeliik (Imeliik), 6.vi.1957, at light, Sabrosky. Koror I: 1♀, 6.iv.1953, at light, J. W. Beardsley; 1♂, 17.iv.1957, Sabrosky; 1♂, 2♀, Ngerabad, 17.iv.1957, at light, Sabrosky; 2♂, 3♀, 24.iv.1957, swept on mangroves, Sabrosky; 1♂, 6.v.1963, at light, Beardsley. Ngerkabesang I: 1♀, 24.iv.1957, mangroves, Sabrosky. Ngurukdapel I: 1♀, Ngaremediu, 24.iv.1957, on beach, Sabrosky. Peleliu I: 1♀, Mt. Amiangal, Gressitt.

JAPAN. Ryukyus: 2♂, 1♀, Urauchi, Iriomote-Jima I., 5.xi.1982, Sasakawa & Y. Yoshiyasu; 1♂, Yaka, Okinawa-Honto I., xi.1961, at light, W. F. Pippin.

Distribution. Micronesia (Mariana Is., Caroline Is., Palau), Japan (Ryukyus).

Discussion. The male genitalia of *phyllodes*, n. sp., are very similar to those of *tripunctata* Sasakawa, known from the Philippines, but most noticeably the broad posterior surstylus is curved distally and densely spinose along inner distal margin in *phyllodes*, n. sp., while truncated distally and sparsely spinose only on inner anteroventral projection in *tripunctata*.

7. *Dasyrhicnoessa vockerothi* Hardy and Delfinado

Dasyrhicnoessa vockerothi Hardy and Delfinado, 1980, Insects Hawaii 3:373 (Hawaii).

This species is very closely related to *D. ferruginea* in general appearance. It is only distinct in the size, wing venation, and male genitalia as follows:

Wing: costal sections in proportion of 5.1:1.8:0.9; r-m distinctly before middle of discal cell; ultimate section of M_{1+2} 2.5 (2.0–3.1) × as long as the penultimate; ultimate section of M_{3+4} about 4/5 (0.7–1.0) length of penultimate.

Abdominal tergites with posterior margins narrowly yellow.

Male genitalia: epandrium with anterior surstylus subquadrate, broadening ventrally, bearing minute setulae on inner ventral side; posterior surstylus oblong, setose on posterior and inner sides; phallus similar to that of *D. ferruginea*.

Lengths: body, male 1.48 (1.1–1.7) mm. female 1.52 (1.3–1.9) mm; wing, male 1.14 (1.0–1.3) mm, female 1.19 (1.1–1.4) mm.

Distribution: Hawaii, Mariana Is., Caroline Is., Wake I., Marshall Is., Kiribati, Ryukyus. New to Micronesia.

MARIANA IS. SAIPAN: 1♀, Achugau, under seaweed, 19.i.1945, H. S. Dybas; 20♂, 4♀, Charan (Cholan) Kanoa, 15.i.1949, swept seaweeds, M. Ross (USNM, M2431, Hawaii 4256, 49-4105); 84♂, 264♀, Lau Lau Beach, 16.viii.1977, swept over rocks and seaweed, J. A. Tenorio; 2♂, 4♀, Charan Kanoa, 15.i.1949, at light, K. I. Mackler. TINIAN: 1♂, 5♀, Tinian Harbor, 20.iii.1945, swept grass by tidal pool, Dybas. GUAM: 2♂, 2♀, Sumay (China Clipper Ports, China-Hong Kong-Manila), 3.ix.1938, R. G. Oakley (USNM); 1♀, Sumay (Philippine Clipper Ports,

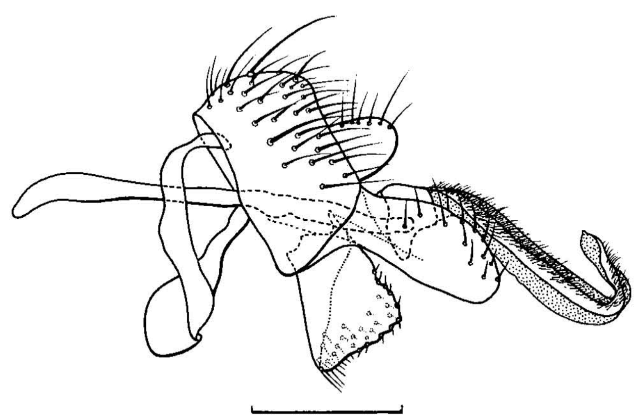


Figure 6. *Dasyrhicnoessa vockerothi* Hardy and Delfinado, male genitalia, lateral view. Scale, 0.1 mm.

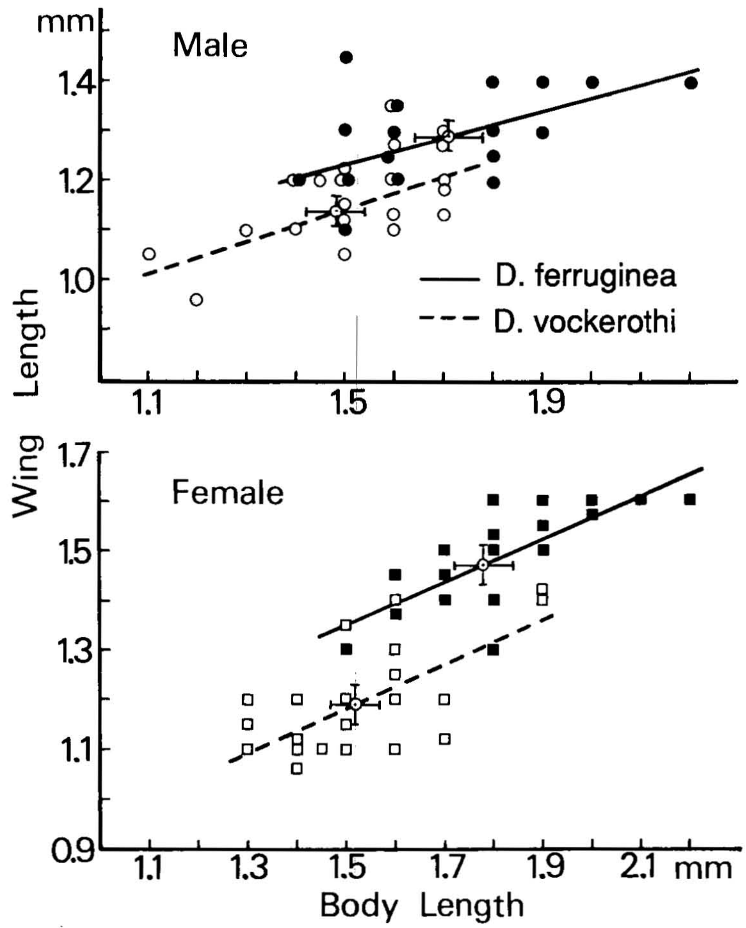


Figure 7. Relation between lengths of body and wing in *Dasyrhicnoessa ferruginea* and *vockerothi*. Cross-bars show the mean values of body and wing lengths and those limits of 95% confidence, respectively.

China-Hong Kong-Manila), 10.ix.1938, Oakley (USNM); 1♀, Sumay, 7.xi.1938, Oakley (USNM); 1♂, 1♀, Pt. Oca. v.1945, G. E. Bohart & J. L. Gressitt; 1♂, Pago Bay, 2.vi.1945, Dybas; 1♂, Pt. Oca, 16.vii.1945, at light, Bohart & Gressitt.

CAROLINE IS. CHUUK: 1♀, Mt. Teroken, 373 m, Moen I., 28.xii.1952, Gressitt. FAIS: 1♂, Fais I., 5.x.1952, N. L. H. Krauss. LAMOTREK: 1♂, Lamotrek Atoll, 5.ii.1953, at light, J. W. Beardsley. YAP: 7♀, Rumang I., 19.vi.1957, at light, C. W. Sabrosky: 5♂, Chol, Map I., 19.vi.1957, Sabrosky; 7♂, Yap (Colonia), Yap I., 4.iii.1949, K. Machler (USNM, M2995, Hawaii 5127, 49-8498); 2♂, Goror (Giliman), Yap I., 11.vi.1957, Sabrosky; 5♂, 2♀, Yap (Colonia), Yap I., 13 & 21.vi.1957, at light, Sabrosky; 3♂, 4♀, Okau (Weloy), Yap I., 14.vi.1957, Sabrosky; 2♂, 1♀, Gatjapar (Gachapar), Gagiel-Tomil I., 19.vi.1957, at light, Sabrosky.

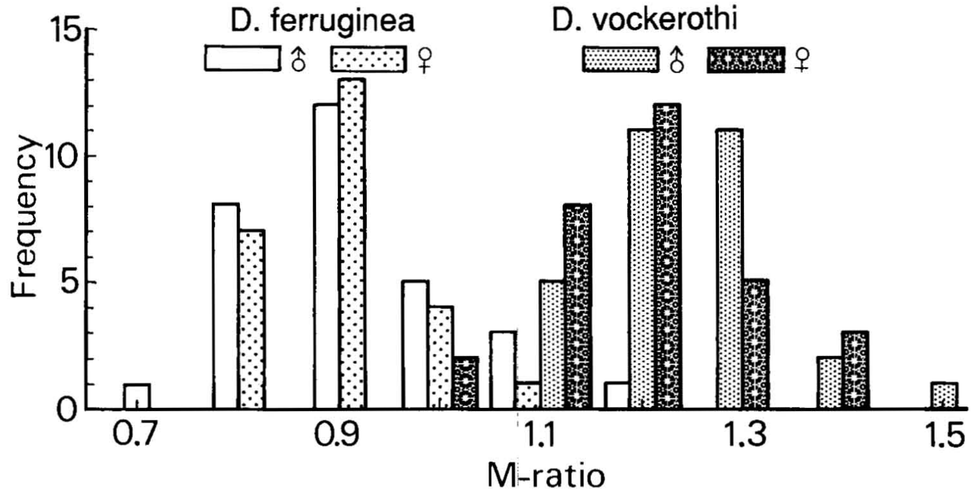


Figure 8. Frequency distribution of M-ratio (relative length between the penultimate section of M_{1+2} and the ultimate section of M_{3+4}) in *Dasyrhicnoessa ferruginea* and *vockerothi*.

PALAU: 1♂, Ngajangel I., Kayangel Is., 15.xii.1952, at light, Gressitt. Babelthuap I: 1♀, E. Ngatpang, 65 m, 8.xii.1952, at light, Gressitt; 6♂, 4♀, Ulimang, 9–10, 13, 16, 19 & 26.xii.1947, Dybas; 1♀, Ogiwal (Ngiwal), 1 m, 16.xii.1952, at light, Gressitt; 2♂, 2♀, Arekalong (Ngerechelong), 6.v.1957, Sabrosky; 9♂, 4♀, Ogiwal, 19 & 21.v.1957, at light, Sabrosky; 40♂, 48♀, Melekeiok, 22 & 23.v.1957, at light and on beach, Sabrosky. Koror I: 3♂, 2♀, 6, 14 & 20.iv.1953, at light, Beardsley; 1♂, 31.v.1953, at light, Beardsley; 6♂, 6, 10 & 20.vii.1953, Beardsley. Peleliu I: 2♂, 5♀, Mt. Amiangal, 22.xii.1952, at light, Gressitt; 1♀, N. end, 28.v.1957, at light, Sabrosky; 1♀, Ngesebus I., 29.v.1957, Sabrosky; 2♂, 6♀, Anguar I., 3–5.ii.1948, Dybas; 2♂, Urukthapel (Ngurukdapel) I., 13.ix.1953, Beardsley; 2♂, 3♀, Ngaremediu, Urukthapel I., 24.iv.1957, on beach, Sabrosky; 13♂, 9♀, SE Ulebsehel I., 24.iv.1957, on beach, Sabrosky; 1♂, Fossarai I., Ulithi Atoll, 10.vii.1946, H. K. Townes (USNM).

WAKE I: 1♂, 1♀, Wake Islet, 1.iii.1959, Y. Oshiro.

MARSHALL IS: MAJURO: 1♂, Majuro Atoll, 4.vii.1950, I. LaRivers (PCAS); 1♂, 2♀, Uliga, Majuro Atoll, 24.ix.1953, Beardsley; 2♂, 5♀, 3–4.xi.1953, Beardsley; 1♀, viii–ix.1955, M. R. Wheeler (USNM). ENIWETOK: 1♂, Eniwetok Atoll, 9.ix.1954, S. R. Edgar (Chicago Nat. Hist. Mus.). JAPTAN: 2♂, 4♀, Eniwetok Atoll, 29.viii–1.ix.1956, L. D. Tuthill (USNM). PARRY: 8♂, 15♀, Ralik Chain, viii–ix.1955, Wheeler (USNM). JIBU: 1♂, Ailinglaplap Atoll, 29.iv.1958, Gressitt. JALUIT: 1♂, Jaluit Atoll, 25.iv.1958, Gressitt. TAGELIB: 1♀, Arno Atoll, 4.vii.1950, LaRivers (PCAS); 1♂, Kwajalein Atoll, 19.ii.1958, N. L. H. Krauss; 2♂, Kwajalein Atoll, 11.xi.1958, C. F. Clagg.

KIRIBATI: BUTARITARI: 9♂, 11♀, Butaritari I., xii.1957, Krauss. TARAWA: 17♂, 34♀, Bikenibeu, i.1970, Krauss; 3♂, 2♀, Naanikai, xi.1957, Krauss;

2♀, Taborio, xi.1957, Krauss; 5♀, Bairiki I., xi.1957, Krauss; 2♀, Banraeaba, xii.1957, Krauss; 3♂, 3♀, Eita I., xii.1957, Krauss.

Remarks. As shown in Fig. 7, the lengths of body and wing between *vockerothi* and *ferruginea* were significantly different ($P < 0.001$, but $P < 0.01$ in the male body length), that is, *vockerothi* is distinctly smaller than *ferruginea.* There are also highly significant differences between the median vein ratio (M-ratio) obtained by dividing the ultimate section of M_{3+4} by the penultimate section of M_{1+2} in both species ($P<0.001$, Fig. 8). The ultimate section of M_{3+4} is longer than the penultimate section of M_{1+2} in *vockerothi* ($\bar{x} \pm S.D. = 1.23 \pm 0.10$ in males, 1.18 ± 0.10 in females), while in *ferruginea* shorter (0.91 ± 0.10 in males, 0.88 ± 0.06 in females).

Hardy and Delfinado (1980) overlooked the hairs on the membranous part of phallus (not bare, hairy as in all *Dasyrhicnoessa*).

Genus Pseudorhicnoessa Malloch

Pseudorhicnoessa Malloch, 1914, Ann. Hist.-Nat. Mus. Hung. 12:306. Type species: *P. spinipes* Malloch, by original designation.

This genus can be clearly separated from the other genera by the termination of costal vein, setose scutellum, and by the presence of antero- and postero-dorsal bristles on the mid and hind tibiae.

8. *Pseudorhicnoessa spinipes* Malloch

Pseudorhicnoessa spinipes Malloch, 1914, Ann. Hist.-Nat. Mus. Hung. 12:307 (Taiwan); Sasakawa, 1974, Akitu (N.S.) 1:6 (Philippines, Vietnam, N. Borneo); 1981, Kontyû 49:520 (Ryukyus); 1986, Kontyû 54:434.

Male. Head yellow; frons testaceous to pale ochreous brown, becoming black dorsally from level of anterior ocellus; ocellar triangle, occiput, and postgena except ventral margin black; orbit, postorbit, face, and gena whitish pollinose; antenna ochreous yellow, 3rd segment brown on ca. ½ of outer dorsal side, arista brownish. Thorax black, densely dusted with gray; humerus and posterior part of notopleuron brownish. Wing hyaline, veins yellow; calypter and halter yellow. Legs yellow; mid and hind coxae sometimes brownish basally; all femora with dark brown apical rings (usually about ¼ of whole length), all tibiae with brown apical rings (⅓ to ½ of whole length), rarely only hind femur and tibia with apical rings, ring of middle femur smaller and paler, ring of mid tibia usually obscure, 4th and 5th tarsal segments of all legs brown. Abdomen slightly shining, brownish black, rarely anterior two segments entirely yellow or yellowish only on lateral side, 2nd to 5th tergites with posterior margins broadly yellow; epandrium shiny brownish black, cercus yellow. Bristles and setae black.

Fronto-orbital bristles 3 pairs; interfrontals 3 or 4 pairs, dorso- and ventromost ones shorter than others; peristomal setae 5 or 6; eye densely covered with minute hairs; gena ¼ to ⅓ height of eye. Arista slightly longer than whole length of antenna, microscopically pubescent.

Mesonotum with 1+3 dorso-centrals, 6 rows of acrostichals, prescutellar strong; scutellum with about 6 rows of setulae on disc; stigmatical bristle slightly

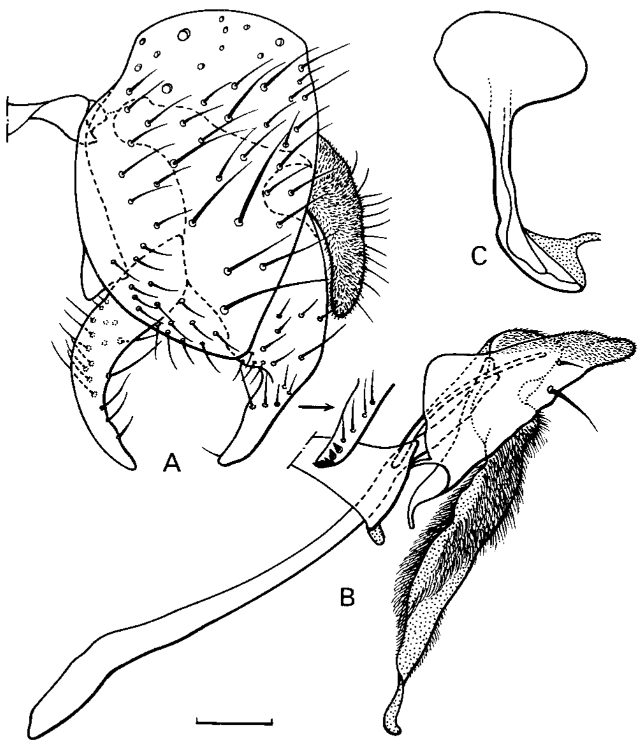


Figure 9. *Pseudorhicnoessa spinipes* Malloch, male genitalia.
A, epandrium and surstyli, lateral view; B, phallus, lateral view; C, ejaculatory apodeme. Scale, 0.1 mm.

thinner than propleural bristle. Wing: costa extending tip of R_{4+5}, 2nd costal section about 3 × as long as the 3rd; R_{4+5} ending at wing tip; r-m slightly before middle of discal cell; ultimate section of M_{1+2} slightly more than 2× length of penultimate section; ultimate section of M_{3+4} nearly 2/3 length of penultimate section. Legs: middle tibia usually with 2 antero-dorsal and 3 postero-dorsal bristles, hind tibia usually with 2 antero-dorsal, 2 dorsal and 2 postero-dorsal bristles.

Genitalia: epandrium with anterior and posterior surstyli elongate, narrowing distally, the latter with 6 or 7 spines on inner apex; phallus of normal shape.

Lengths: body 2.0–3.0 mm, wing 1.7–2.5 mm.

Female. Differs from male as follows: all femora and fore tibia brown on distal 1/2 (sometimes 3/4 to 4/5 of whole length of femora, tibia entirely brown except base), 6th tergite with caudal margin yellow, ovipositor yellow.

Lengths: body 1.8–3.1 mm, wing 1.7–2.5 mm.

Distribution. Taiwan, Philippines, N. Borneo, Vietnam, Japan (Ryukyus), Mariana Is., Caroline Is., Palau, Marshall Is. New to Micronesia.

MARIANA IS. SAIPAN: 1♀, Tuturam (Lau Lau Bay), 22.i.1945, H. S. Dybas; 8♂, 10♀, Charan (Cholan) Kanoa, 15.i.1949, swept seaweeds, Ross (USNM,

M2431, Hawaii 4256, 49–4105); 1♀, Lau Lau Beach, viii.1977, swept over rocks and seaweeds, J. A. Tenorio. GUAM: 2♂, 2♀, Inarajan, 6.v.1936, on seaweed, R. L. Usinger; 3♂, 2♀, Agat, 19.vi.1936, Usinger; 1♂, Pt. Oca (NMRU 2), 16.vii.1945, at light, G. E. Bohart & J. L. Gressitt.

CAROLINE IS. YAP: 1♂, Rumang I., 17.vi.1957, at light, C. W. Sabrosky; 2♂, 1♀, Chol, Map I., 19.vi.1957, Sabrosky. TOBI: 1♀, 12.ix.1952, N. Krauss.

PALAU: Babelthuap I: 1♂, 3♀, Ogiwal (Ngiwal), 19.v.1957, on beach, Sabrosky; 10♂, 7♀, Melekeiok, 23.v.1957, on beach, Sabrosky.

MARSHALL IS. LIKIEP: 1♀, Likiep Atoll, 30.viii.1946, H. K. Townes (USNM). MAJURO: 3♂, 10♀, Majuro Atoll, 28.viii.1946, Townes (USNM). ALU: 1♀, Mili Atoll, 3.x.1953 [collector unknown]. JIBU: 1♀, Ailinglaplap Atoll, 29.iii.1958, Gressitt.

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